

INDEX

Subject Index

	Page
Appendix A (Opinions of Seventh Circuit Court of Appeals)	1
Appendix B (Opinions of the United States District Court for the Northern District of Illinois)	23
Appendix C (Denial of Petition for Rehearing)	49
Appendix D (Selected Findings of Fact of Lower Court)	51
Appendix E (Selected Pages From the Transcript of the Trial and Plaintiff's Answer to Defendants' Interrogatory 18	55

ment and unenforceability of patent. The United States District Court for the Northern District of Illinois, Eastern Division, William J. Lynch, J., entered judgment for plaintiff, and defendants appealed. The Court of Appeals, Hastings, Senior Circuit Judge, held that patent No. 2,808,332 relating to process for feeding ruminants and improved feed supplement therefor is valid; and that such patent, which was narrowly construed as limited to the teaching of the addition of alcohol in feed supplements, was not infringed.

Affirmed in part; reversed in part.

Stevens, Circuit Justice, dissented in part with an opinion.

1. Patents key 328(2)

Patent No. 2,808,332 relating to process for feeding ruminants and improved feed supplement therefor is valid. 35 U.S.C.A., §§ 103, 112.

2. Patents key 324.56

Record established that trial court did not prejudicially err in finding that there had been no lack of candor in plaintiff's dealings with patent office with respect to citations of prior art.

3. Patents key 328(2)

Patent No. 2,808,332, relating to process for feeding ruminants and improved feed supplement therefor, which was narrowly construed as limited to the teaching of the addition of alcohol in feed supplements, was not infringed.

Fred T. Williams, John J. Cavanaugh, Chicago, Ill., for defendants-appellants.

Thomas Cifelli, Jr., Maplewood, N. J., Albert W. Bicknell, Chicago, Ill., for plaintiff-appellee.

Before STEVENS, Circuit Justice*, FAIRCHILD, Chief Judge, and HASTINGS, Senior Circuit Judge.

HASTINGS, Senior Circuit Judge.

This is an action for patent infringement with a counterclaim for a declaration of invalidity, noninfringement and unenforceability of the patent in suit. It was tried to the court¹ without the intervention of a jury.

Plaintiff Feed Service Corporation is a Nebraska corporation with its principal office and place of business near Crete, Nebraska. Defendant Kent Feeds, Inc., has a place of business at Rockford, Illinois, and is wholly owned and controlled by defendant Grain Processing Corporation. Both defendants are Iowa corporations.

Plaintiff and defendant Kent Feeds, Inc., make and sell feeds and feed supplements for cattle. They are competitors in this business. Defendant Grain Processing Corporation makes and sells feed ingredients to Kent Feeds, Inc.

Plaintiff's patent in suit was issued October 1, 1957, as Patent No. 2,808,332 (the '332 patent), entitled "Process

*Mr. Justice Stevens participated initially as Circuit Judge, and on and after December 19, 1975, as Circuit Justice.

¹ The United States District Court for the Northern District of Illinois, the Honorable William J. Lynch, Judge, presiding.

For Feeding Ruminants And Improved Feed Supplement Therefor." The patent was issued on an application filed February 17, 1955, by Philip C. Anderson and Janet L. C. Rapp, co-inventors. Anderson was president of plaintiff and Dr. Rapp was plaintiff's Director of Laboratories. The patent was assigned to and at all relevant times was owned by plaintiff.

The patent in suit expired during the pendency of this proceeding, on October 1, 1974. No question concerning injunctive relief is an issue here.

I

As disclosed in the '332 patent, "ruminants" include cattle, sheep, camels, goats, bison and other animals. The invention here is specifically exemplified in connection with its application to cattle.

One of the chief problems in raising cattle for meat production is to achieve the most economical utilization of feed ingested by the cattle. It normally requires about $2\frac{3}{4}$ years to raise a newborn calf to an animal of slaughter size. During part of this period, the cattle are fed naturally occurring but relatively expensive nitrogen-containing products, such as linseed oil. In addition to the disadvantage of higher costs, the use of such products involves an undesirable deterioration of the quality of land by the removal of the nitrogen-containing products.

Plaintiff began manufacturing a liquid feed for ruminants in 1951. For the first four years a restrictive combination of molasses, urea, phosphoric acid and water was used and was found to be unsatisfactory for commercial purposes. This product was known as the first generation liquid feed.

Over a period of about $2\frac{1}{2}$ years Anderson and Rapp tried various materials in combination with urea, in searching for a commercially suitable liquid feed as efficient as an oil seed meal in producing gains in animals.

The invention in the '332 patent came to light when Anderson and Rapp conceived the idea of incorporating ethyl alcohol and a synthetic nitrogen source in feed supplements. They formulated feed supplements containing ethyl alcohol (sometimes referred to as "alcohol" or "ethanol") and urea as the source of synthetic nitrogen.

It was conceded that ethyl alcohol was well known and was present in distillery slop used in animal feeding. However, the inventors claimed that ethyl alcohol was not purposely incorporated in prior feed supplements to produce unexpected advantages as is the case with the patented invention.

Tests conducted by plaintiff demonstrated that the use of its formulated feed supplement, containing ethyl alcohol and urea as the source of synthetic nitrogen, enhanced the ability of the test animals to consume larger amounts of feed and to make better gains.

II.

The file wrapper discloses that after the application for the patent in suit on February 17, 1955, it had a rather stormy career in the Patent Office. The Examiner rejected all claims on August 25, 1955, for a wide variety of reasons. On October 25, 1955, the applicants responded in an effort to meet the Examiner's reasons for rejection. After considerable sparring back and forth, the Examiner again rejected certain claims on December 11, 1956. The

applicants responded, and finally, on October 1, 1957, the patent was issued in its present and final form. It was a narrower patent than the one originally sought.

The '332 patent contains twenty-one claims, the first seven of which are process claims and the remainder are composition claims.

The inventors stated that "an object of our invention is the provision of a process and composition for use as a feed supplement in order to obtain maximum economic food production from the ruminants in minimum periods [and] * * * to increase the utilization by ruminants of materials such as synthetic nitrogeneous materials, and cellulose and other inexpensive ruminant feed-stuffs."

Among other results claimed by using the present invention is a reduction in the processing period of cattle to fifteen months. The inventors further stated that the use of ethyl alcohol in this manner did not result in the cattle overeating, but that when cattle were fed free choice, they ate only such quantities of the feed supplement as could be utilized to yield optimum growth conditions, this being a surprising and unique result.

The patent in suit listed some nine requirements of any additives intended for incorporation in the feed. After a showing of the proper use of the claimed combination, seven examples, in which parts by weight were given, were listed to illustrate the invention. At the conclusion of a discussion of the science of nutrition, there followed the listing of the twenty-one claims.

Claims 11 and 16 are illustrative of the patent claims and read as follows:

11. A feed supplement for ruminants comprising urea and ethanol in an amount effective to increase the nitrogen-retention ability of ruminants, said amount being from about 1 to 12 parts by weight per 10 parts by weight of urea.

16. A feed supplement for ruminants comprising urea, phosphoric acid, molasses and ethanol in an amount effective to increase the nitrogen-retention ability of ruminants.

III.

Trial of this action was held on December 2-5, 1974. Both inventors testified for plaintiff, together with Mr. Augustin, a farmer and cattle feeder for 35 years; Dr. Garrison, an officer of East Shore Chemical Company, Muskegon, Michigan; Mr. Billington, a partner in Kern Research Laboratories, Bakersfield, California; and Dr. Dunn, of Bjorksten Research Laboratories, Inc., Madison, Wisconsin. Four witnesses testified for defendants: Dr. McDonald, Ruminant Nutritionist for Kent Feeds; Dr. Malzahn, Technical Director, and Dr. Kiser, Manager of Analytical Development, both of Grain Processing Corporation; and Dr. Burroughs, Professor of Animal Science at Iowa State University.

The trial court did not set any post-trial briefing schedule or request oral argument. On December 10, 1974, the court entered a judgment order in favor of plaintiff and requested the parties to submit proposed findings of fact and conclusions of law within ten days. This time was subsequently extended to February 7, 1975. Plaintiff submitted its proposed findings and conclusions on February 7, 1975. Defendants did not submit any findings and conclusions. On February 26, 1975, the court adopted plaintiff's proposed findings and conclusions as its own and

rendered judgment in favor of plaintiff in this expanded form, but without any memorandum opinion. Defendants have timely appealed.

In sum, the trial court found and held (1) that plaintiff's '332 patent was valid; (2) that all twenty-one claims of the '332 patent were infringed by defendants by reason of their manufacture and sale of the accused feed supplement compositions; (3) that defendants' infringement of the patent was knowingly, willfully and wantonly done and entitled plaintiff to an award of treble damages, costs, expenses and attorneys' fees; and (4) that an accounting be had by the court to determine the damages, and a hearing be had to determine the amount of costs, expenses and attorneys' fees.

However they may be phrased, the issues before us on this appeal relate directly to the correctness of the trial court's actions in each of the foregoing findings and conclusions.

IV.

At the outset we observe defendants' critical reference to the trial court's adoption in toto of the proposed findings and conclusions submitted by plaintiff and the absence of any memorandum opinion, and also the implied critical reference to the absence of any post-trial briefing or oral argument. We are fully cognizant of the shortcomings of these procedures and do not give them our unqualified blessing.

However, it must also be noted that defendants did not submit any proposed findings or conclusions, did not make objection to those submitted by plaintiff before their adop-

tion by the court, and did not make objection to the post-trial procedure used by the court. In lieu thereof, defendants timely appealed. Hence, we take the case as we find it.

It appears to be well established that plaintiff was a relatively small newcomer in the feed supplement business. It began commercial exploitation of the invention in suit in April and May 1955. It sold its formulated liquid supplement under the trademark "Morea" and met with early commercial success. This is illustrated by the fact that between 1955 and 1973, a total of about 8,000,000 gallons of ethanol were used commercially in its patented Morea product. This amount of alcohol is the equivalent of over 400,000 tons of Morea liquid feed. Domestic cattle fed with Morea involved in this litigation were valued at from 1½ to 2 billion dollars. This was also shown to have been the total value, calculated on the basis of royalty income, of foreign cattle fed by plaintiff's foreign licensees.

At this juncture it should be observed that plaintiff secured forty-seven corresponding foreign patents on the same invention. These included patents from well known countries and are listed in the record. Only Brazil denied plaintiff's application, and it does not issue patents on feed-stuffs.

The trial court found from the testimony of Mr. Augustin, a cattle feeder of 35 years experience, that for some years he had purchased from plaintiff the product hereinabove referred to as "first generation liquid feed"; that after trying out the Morea product, he stopped using the prior first generation product; and that over a period of the past twelve years he purchased about \$480,000 worth of Morea each year. Mr. Augustin testified that

he secured greater weight gains and had a more satisfactory market for his cattle because there was a marbling through the meat instead of fat on the outside, resulting in a more palatable product.

The only reference cited in the patent in suit is an extract from an article by Winslow, *Veterinary Materia Medica and Therapeutics* 217 (8th ed. rev. 1919). The file wrapper indicates that the rejections because of Winslow were satisfied during the course of the proceedings in the Patent Office.

We deem it appropriate here to make specific reference to certain findings of fact by the trial court as they may be relevant to the question of validity of the '332 patent.²

16. The patented feed supplement is bottomed on the conjoint use of synthetic-nitrogen substances, e. g., urea, and ethanol, in a ratio such that cattle co-fed with it will have the property or ability to retain more nitrogen, i. e., the cattle will have increased true weight gains. The preferred ratio is from about 1 to 12 parts by weight of ethanol to 10 parts by weight of urea, or the equivalent of the latter. The combination of the specific amounts of urea and ethanol bring about synergistic results, i. e., the results are better than would be expected from the contributions of each of the ingredients, used separately.

17. The specification of the patent in suit contains a description of the invention in such full, clear, concise and exact terms as to enable the patented feed supplement to be made and used by those skilled in the art.

² Record page references and citations are omitted.

18. Those skilled in the art include cattle feeders and those in experimental stations who teach others to feed cattle.

20. The claims of the patent in suit particularly point out and distinctly claim the patented feed supplement.

21. The term "nitrogen retention ability" has adequate basis in the specification as filed, and was understood by defendants and by defendants' counsel.

22. A nitrogen retention test is and was, at the time of filing the patent application, a measurement of true growth well known by technical workers in experiment stations and by defendants. Actual feeders refer to weight gain which in Augustin's commercial feedlots increased from an average daily gain of 2.7 pounds to an average of 3 pounds or better when the supplement embodied in the patent in suit was fed. The specification of the patent in suit also refers to the cattle making "good" gains and appearing healthy after being co-fed the patented feed supplement.

Based upon our examination of the record as a whole, we cannot say that these foregoing findings of fact are clearly erroneous in light of Rule 52(a), Federal Rules of Civil Procedure, 28 U.S.C., and in a patent case involving conflicting testimony as related to scientific problems. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 610, 70 S. Ct. 854, 94 L. Ed. 1097 (1950).

Defendants assert in substance that the trial court erred in holding the '332 patent valid because it did not follow the standards of determining obviousness pursuant to 35

U.S.C., § 103,³ as required by *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 86 S. Ct. 684, 694, 15 L. Ed. 2d 545 (1966). This oft-quoted reference reads:

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.

We must reject defendants' contention. A reading of findings 58-60 leads to finding 61:

61. The Court, after determining the scope and content of the prior art, ascertaining the differences between the prior art and the claims at issue, and resolving the level of ordinary skill in the art of making and using feed supplements for ruminants (cattle), finds that the claims in the patent in suit are all valid.

³ 35 U.S.C., § 103 provides:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Then follow findings 62-86 which deal explicitly with all references to the prior art cited by defendants. In light of these findings of fact and our consideration of the record as a whole, we cannot say that the trial court erred in this respect. To the contrary, we find a faithful observance of the standards laid down in *John Deere* and in Section 103.

Defendants further assert that the trial court erred in holding the patent in suit valid without observing the standards of definiteness required by 35 U.S.C., § 112,⁴ and particularly cite *Pambello v. Hamilton Cosco, Inc.*, 7 Cir. 377 F. 2d 445 (1967). In that case the trial court found certain claims to be a "mass of vague, repetitive, and ambiguous verbiage," but nevertheless held such claims to be valid. *Id.* at 446. Our court agreed with the finding that the claims were vague and ambiguous and held them to be invalid under Section 112. We said further: "Section 112 requires, as a prerequisite to validity, that patent claims particularly point out and distinctly claim the subject matter which the applicant regards as his invention. Ambiguous, indefinite and vague patent claims are void." *Id.* at 447.

⁴ 35 U.S.C., § 112 provides in relevant part:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The dispute in the case at bar centers around a claimed ambiguity in the use of the phrase "nitrogen retention ability" in the patent claims without defining its meaning elsewhere in the patent and particularly in the specifications, as mentioned in Section 112.

Here there is no dispute about the proper scope and meaning of the phrase "nitrogen retention." Defendants focus on the use of the word "ability" therewith. The crux of the matter is whether the addition of the word "ability" somehow alters the meaning of the acceptable phrase "nitrogen retention." It appears from the record that there was conflicting evidence on this difference. The trial court accepted plaintiff's view. Since the tests for measuring "nitrogen retention" were concededly well known in the art, one wonders what obligation there was on the inventors to teach or describe the art already known.

In *Ellipse Corporation v. Ford Motor Company*, 7 Cir., 452 F. 2d 163, 167 (1971), cert. denied, 406 U.S. 948, 92 S. Ct. 2041, 32 L. Ed. 2d 337 (1972), we held that in determining the scope and meaning of patent claims they should "be construed in the light of the specifications and both are to be read with a view to ascertaining the invention * * * [and a] patentee can choose his own terms and use them as he wishes so long as he remains consistent in their use and makes their meaning reasonably clear." (Citations omitted.) Further in *Ellipse*, in answering the specific contention made here by defendants, the court said: "However, Section 112 is satisfied where the patentee reasonably discloses the subject matter of the invention in terms which are reasonably clear and consistent. The patentee is his own lexicographer." *Id.* at 170.

We find that the trial court did not err in holding the patent in suit valid in this respect, but in fact properly applied Section 112 to the case at bar.

It has not been shown that there is anything in the prior art disclosing the composition of alcohol and urea as taught in the patent in suit. This appears to be the classic case of a combination of two elements old in the art which produced a new and useful result. In this respect it is a narrowly construed patent and must necessarily be so.

[1] In light of the foregoing resolutions, together with the showing of commercial success, we have no difficulty in finding that the patent in suit is valid as to all of its claims and we so hold.

V.

Defendants urge that the trial court erred in finding that the applicants for the patent in suit did not misrepresent or conceal from the Patent Office any relevant prior art which they knew of during the prosecution of their patent application. In short, defendants charge a complete lack of candor.

This charge arises from the use of the following statement in the '332 patent: "However, though we have made diligent search therefor, we have failed to find any suggestion that the common ethanol could be incorporated in feed supplements for ruminants with its consequent unexpected advantages."

Defendants charge plaintiff with failure to call to the attention of the Patent Office certain prior art discovered by plaintiff's searcher prior to the filing of the patent ap-

plication. Defendants claim this art dealt with "ethyl alcohol in animal feeds."

It appears that none of the references in question disclose the concept of using urea and ethanol in feedstuffs in accordance with the claims. The trial court properly pointed out the differences between the patent in suit and Defendants' Exhibits 27, 28, 31 and 32 in its findings Nos. 75, 76, 79 and 80. Defendants did not rely on these four exhibits in challenging the validity of the patent for alleged obviousness. Plaintiff contends that, with one exception, it knew of these prior art references but did not consider them relevant to anything beyond what the patent itself stated.

A further charge is leveled by defendants because of plaintiff's failure to call the Patent Office's attention to the German article by one Pott entitled "Manual of Animal Feeding and Agricultural Feeds." The article relates, *inter alia*, to the use of alcohol in animal feedstuffs. In fact, it teaches against its excessive use.

Plaintiff translated and published the Pott article for public consumption. No attempt was made to conceal it. The German Patent Office cited Pott against the plaintiff's German application but granted the patent upon a showing that it was not pertinent.

Our court in *Wen Products, Inc. v. Portable Electric Tools, Inc.*, 7 Cir., 367 F. 2d 764, 767 (1966), held that there was no "unclean hands" on the part of the applicant-patentee for failure to disclose a prior art patent that "did not embody the inventions of the claims in suit." And in *Scott Paper Company v. Fort Howard Paper Company*, 7 Cir., 432 F. 2d 1198, 1204 (1970), *cert denied*, 401

U.S. 913, 91 S. Ct. 882, 27 L. Ed. 2d 812 (1971), we held that "unclean hands" or fraud must be based on "clear, unequivocal and convincing evidence"; and, further, that "unclean hands" could be asserted "only if there has been a deliberate misrepresentation in the Patent Office."

[2] We have considered the various charges of "lack of candor" against plaintiff and, in light of the criteria established by our court, we find them unconvincing. The trial court did not prejudicially err in finding that there was no lack of candor in plaintiff's dealings with the Patent Office.

VI.

The question of infringement poses a more difficult problem. The trial court found that all twenty-one claims of the patent in suit were infringed by defendants' accused product. The accused product was marketed under the copyright trade name of "Bovino" and was to be used in conjunction with Kent's FM-32 Complement.

As shown in Plaintiff's Exhibit 11, which is defendants' brochure on the product, Bovino is a fermented molasses product whose ingredients are fermented molasses, cane (blackstrap) molasses, corn distillers solubles, corn steep-water, ammonium polyphosphate, urea, ammonium sulphate and salt. In making Bovino, cane molasses is fermented through the addition of yeast and heat to produce an end product containing alcohol and molasses fermentation solubles.

Defendants' brochure claims that Bovino is a "revolutionary beef feeding breakthrough" in that it features the use of fermented molasses for faster rate of gain, better

feed efficiency, improved carcass quality and higher returns and profits. It is shown that Bovino is not a complete liquid supplement, and that it should be fed with FM-32 Complement, which contains all the additional nutrients and growth factors needed. The components and guaranteed analysis are set out. Methods of feeding and results of research are indicated. Agitation of the product is required.

A later development, "Bovino-Lac" products, are shown to be complete liquid supplements made from a base of Bovino with the benefit of fermented molasses and requiring the feeding of additional calcium after agitation. Further shown are cattle liquid feed supplements 32 and 44 made from unfermented molasses, which are well suited for lick tanks.

The fact that the fermentation process of the blackstrap molasses converts virtually all of the sugar in the molasses to alcohol and then is followed by the other additives, including urea, gives rise to the basic claim of infringement.

As hereinabove pointed out, the novelty of the patent in suit was the conception of the idea of incorporating ethyl alcohol and a synthetic nitrogen source in feed supplements. This led to the formulation of feed supplements containing ethyl alcohol and urea as the source of synthetic nitrogen. As plaintiff's claim 11 states, the feed supplement comprises urea and ethanol in an amount effective to increase the nitrogen-retention ability of ruminants in an amount of about 1 to 12 parts of ethanol by weight per 10 parts by weight of urea. Claim 16 describes a feed supplement comprising urea, phosphoric acid, molasses

and ethanol in an amount to increase the nitrogen-retention ability of ruminants.

[3] We do not read the claims in suit to be broad enough to cover all feed supplements containing urea and ethanol no matter how the alcohol is obtained. We read the claims to teach the use of alcohol in its liquid form and not the use of alcohol derived in a fermentation process of molasses or from other fermented sources. Although plaintiff strenuously argues to the contrary, we incline to the more narrow view that the '332 patent in suit covers the *addition* of alcohol as such to its claimed combination. We cannot say that its monopoly extends to the mere presence of alcohol resulting from a molasses fermentation process.

Plaintiff concedes on brief that the process claims (1 to 8) call for "incorporating" ethanol in feed for ruminants. However, they assert that the composition claims (9 to 21) are not limited as to the manner in which ethanol is incorporated into the feed supplement. In the court's findings Nos. 41-45, plaintiff seeks to demonstrate that the accused product, however composed, accomplishes the same results as those specified for Morea in claims 11-16 of their patent.

We have noted the variety of tests relating to nitrogen-retention ability, the literature dealing with the various aspects of the use of alcohol in feed supplements for ruminants and the cattle testing engaged in by both parties, together with the testimony of the witnesses relating to the question of infringement. It all adds up to a determination of a close question of infringement.

Certain things have become crystal clear to us at this

time. In our considered judgment the plaintiff is limited to a narrow construction of the patent in suit. Defendants do not *add* alcohol to their feed supplements and plaintiff does not charge them with that. The charge of infringement is based on the use by defendants of fermented molasses which provides the alcohol in question as a natural occurring event. We have concluded that the patent in suit is limited to the teaching of the *addition* of alcohol in feed supplements. The fact that the defendants' Bovino product may reach the same result as plaintiff's Morea is not conclusive of the determination of infringement. It is all a far cry from plaintiff's overzealous charge of blatant infringement, literal piracy and outright duplication.

We hold that the trial court erred in finding that defendants infringed the patent in suit.

In view of our holding of noninfringement, we do not reach the question of the award of treble damages and attorneys' fees.

Based on the foregoing, the judgment of the district court finding the patent in suit to be valid and enforceable is affirmed; the judgment finding the patent in suit to be infringed and the award of treble damages and attorneys' fees is reversed. It is ordered that each party shall bear its own costs.

Affirmed in part.

Reversed in part.

STEVENS, Circuit Justice (dissenting in part):

Although I would not sustain the award of treble dam-

ages and attorneys' fees, I am not persuaded that the finding of infringement is clearly erroneous. I agree with Judge Hastings' conclusions that the patent is valid and that the claims only cover the addition of alcohol in feed supplements, but it seems to me that the incorporation of fermented molasses is a method of adding ethanol.

APPENDIX B

District Court, N. D. Illinois, Eastern Div.

Feed Service Corporation v.
Kent Feeds, Inc., et al.

No. 73 C 1102 Decided Feb. 26, 1975

PATENTS

1. Accounting — Increased or treble damages or profits
(\$11.35)

“Willful and wanton” infringement of patent entitles patent owner to have damages increased up to three times amount assessed, as prescribed by 35 U.S.C. 284.

Particular patents - Feeding Ruminants

2,808,332, Anderson and Rapp, Process For Feeding Ruminants And Improved Feed Supplement Therefor, valid and infringed.

Action by Feed Service Corporation against Kent Feeds, Inc. and Grain Processing Corporation for patent infringement, in which defendants counterclaim for declaration of patent invalidity, noninfringement, and unenforceability Judgment for plaintiff.

Hibben, Noyes, & Bicknell, Chicago, Ill., and Cifelli & Behr, Maplewood, N. J., for plaintiff

Fred T. Williams and Pendleton, Neumon, Williams & Henderson, both of Chicago, Ill., for defendants.

Lynch, District Judge.

Findings of Fact and Conclusions of Law

This Court, having heard all the evidence presented at

the trial of this cause and after reviewing all of the depositions and other documents submitted to the Court and being duly advised, does now set forth the following Findings of Fact and Conclusions of Law contained herein:

Every Finding of Fact is either uncontested or is supported by a citation to the record before the Court.

The meanings of the citations which follow are as follows:

- "P." refers to plaintiff;
- "D." refers to defendants;
- "PX" refers to plaintiff's exhibit;
- "DX" refers to defendants' exhibit;
- "Ad." refers to admission;
- "R." refers to the transcript of the trial proceedings;
- "Dep." refers to deposition;
- "Int." refers to interrogatory;
- "PTO" refers to Pretrial Order herein.

I. Findings of Fact

A. Nature of Action and Jurisdiction

1. This is an action for patent infringement with a counterclaim for a declaration of invalidity, non-infringement and unenforceability of the patent suit. Jurisdiction and venue of the Court are invoked under Sections 1338(a) 1400(b), 1694 and 2201 of Title 28 U.S.C.A. and Sections 271, 281, 283, 284, and 285 of Title 35 U.S.C.A. The jurisdiction and venue of the Court are not disputed.

B. The Parties

2. Plaintiff, Feed Service Corporation, is a Nebraska

corporation having its principal office and place of business on State Highway 33, two and one-half miles east of Crete, Nebraska, and whose post office address is P. O. Box 270, Crete, Nebraska 68333.

3. Defendant, Kent Feeds, Inc., is an Iowa corporation having a regular and established place of business at 1612 South Bend Road, Rockford, Illinois 61109, within the Northern District of Illinois, and is wholly-owned and controlled by Grain Processing Corporation.

4. Defendant Grain Processing Corporation, is an Iowa corporation.

5. Plaintiff and defendant Kent Feeds, Inc. make and sell feeds and feed supplements for cattle. Defendant Grain Processing Corporation makes and sells feed ingredients to Kent Feeds, Inc.

6. On October 1, 1957, United States Letters Patent No. 2,808,332, entitled "Process For Feeding Ruminants And Improved Feed Supplement Therefor", the patent in suit, was issued to plaintiff Feed Service Corporation in the name of Philip C. Anderson and Janet L. C. Rapp as inventors. Plaintiff is now, and has been at all times since issuance, the owner of the entire right, title and interest in and to said United States Letters Patent No. 2,808,332. Mr. Anderson is president of plaintiff and Dr. Rapp is employed by plaintiff.

7. The patent in suit expired during the pendency of this proceeding, on October 1, 1974, and therefore the Court is not called on to issue an injunction at this time.

C. Background and Development of the Patented Invention

8. The plaintiff corporation commenced manufacturing a liquid feed for ruminant animals in 1951. The liquid feeds produced in the period of 1951 to 1955 were restrictive combinations of molasses, urea, phosphoric acid and water (R.14). This product, sometimes referred to as the first generation liquid feed, was found to be weak nutritionally in that cattle fed with the first generation liquid feed and ground corn cobs were unable to gain weight (R.21). Plaintiff's president considered the use of the first generation liquid feed by the feeding industry to be quite restricted and unsuitable for commercial exploitation (R.22).

9. The inventors, Anderson and Rapp, believed that a commercially suitable liquid feed must be as efficient as an oil seed meal in producing gains in animals if it was to have wide commercial application. They tried various materials in combination with urea, such as glycerin, propylene glycol and corn oil, over a period of about 2½ years (R.23).

10. The Anderson-Rapp invention involved in this suit came into being when the inventors conceived of the combination of ethyl alcohol and a synthetic nitrogen source in February 1955. They formulated feed supplements containing ethyl alcohol and urea, as the source of synthetic nitrogen (PX 1).

11. An immediate and dramatic improvement was found in the ability of test animals to consume larger amounts of feed and to make better gains (R. 23).

12. Products made under the patent in suit were first formulated and offered commercially between April 13 and May 13, 1955 (Anderson Dep. 22-23). Initially, all

customers were offered the opportunity to select either the first generation liquid feed or, at a 20 to 25% higher price, a liquid feed containing both ethyl alcohol and urea. All then-existing customers, save one, chose to purchase the more expensive liquid feed made under the Anderson-Rapp patent (R. 419).

D. The Patent in Suit

13. The patent in suit (PX 1) is directed to an improved feed supplement for ruminants (e.g., cattle) and to an improvement in the preparation of a feed for the ruminants. The raising of cattle for meat production is beset by a number of problems. One of the chief problems in this connection is the most economical utilization of feed ingested by the cattle. The normal period required in raising a new-born calf to a slaughter-size animal is about 2¾ years. During part of this period the cattle are fed naturally-occurring, relatively expensive, nitrogen-containing products, such as linseed meal. In addition to their costs, the use of such products is disadvantageous because it involves a deterioration of the quality of land, which is a factor of increasing concern to many, not only in the U.S.A. but elsewhere (PX 1, Col. 1, lines 22-33).

14. Among the specific objectives of the inventors were the provision of a process and composition for use as a feed supplement in order to obtain maximal economic food production from the ruminants in minimal periods and to increase the utilization by the ruminants of materials such as synthetic nitrogenous materials, cellulose and other inexpensive, natural ruminant feed stuffs (PX 1, Col. 1, lines 56-63).

15. As a result of the patented feed supplement the following advantageous results, inter alia, have been attained:

a. The normal period required in raising new-born calves to slaughter-size animals can be reduced (PX 1, Col. 1, lines 22-30).

b. The cattle need not be co-fed relatively expensive nitrogen-containing products which cause deterioration of the quality of land (PX 1, Col. 1, lines 30-33).

c. The cattle may be co-fed and may utilize synthetic nitrogen-containing materials, cellulose and other inexpensive natural ruminant feedstuffs, such as corn cobs (PX 1, Col. 1, lines 60-63 and Col. 2, lines 56-58).

d. Cattle may be fed free-choice, i.e., the feed supplement of the invention may be placed in a convenient indoor or outdoor place and the cattle will eat it without engorging themselves (PX 1, Col. 2, lines 54-55 and Examples 1-7).

e. The cattle make good growth gains, thereby making the use of the patented feedstuff economically feasible (See subparagraph 15a above and PX 1, Examples 1-7).

f. Cattle co-fed with the patented feed supplement grade higher and possess improved "marbling", as compared with cattle fed similar rations without the patented supplement. The term "grade higher" means that if cattle which would otherwise grade "good" under U. S. D. A. Standards will grade as "choice" if co-fed the patented feed supplement.

g. The patented feed supplement also meets the following diverse requirements (PX 1, Col. 2, line 54 to Col. 3, line 4):

(1) The additive should not be so palatable to the ruminant that the latter will over-indulge to its detriment.

(2) The additive should assist the ruminant's symbiotic digestive system so as to increase the appetite of the ruminant for inexpensive roughage, such as corn cobs.

(3) The additive should preferably be a liquid so as to be in harmony with the known advantages of liquid feeds.

(4) The additive should not contribute any residues in the ruminant which have toxic effects on man. Certain animal hormones are disadvantageous in this respect.

(5) The additive should not cause a down-grading of carcass grades but desirably improve them. Certain thiol compounds and certain animal hormones are deleterious in this regard.

(6) The additive should not cause the feed supplement to be less palatable.

(7) The additive should be nontoxic to the ruminant and its microflora in the amounts ingested.

(8) The additive must be compatible with the other ingredients in the feed supplement and not cause deterioration during periods of storage.

(9) The additive must be economically feasible in the amounts employed.

16. The patented feed supplement is bottomed on the conjoint use of synthetic-nitrogen substances, e.g., urea, and ethanol, in a ratio such that cattle co-fed with it will have the property or ability to retain more nitrogen, i.e., the cattle will have increased true weight gains. The preferred ratio is from about 1 to 12 parts by weight of ethanol to 10 parts by weight of urea, or the equivalent of the latter (see, e.g., PX 1, Col. 3, lines 68-71). The combination of the specific amounts of urea and ethanol bring about synergistic results, i.e., the results are better than

would be expected from the contributions of each of the ingredients, used separately (R. 98, 417).

17. The specification of the patent in suit contains a description of the invention in such full, clear, concise and exact terms as to enable the patented feed supplement to be made and used by those skilled in the art.

18. Those skilled in the art include cattle feeders and those in experimental stations who teach others to feed cattle (R. 209).

19. Defendants offered no testimony regarding efforts to follow the teachings of the patent to see what results were obtained (McDonald Dep. 25-26; R. 286). Nor did defendants ever perform any test, experiment, or other work, besides prior art searches and their tests represented by DX 3, which furnished any evidence as to the validity or invalidity of the claims in suit (D. Ans. to P. Int. 40).

20. The claims of the patent in suit particularly point out and distinctly claim the patented feed supplement.

21. The term "nitrogen retention ability" has adequate basis in the specification as filed (R. 73-74, 222), and was understood by defendants (DX 3; PX 48) and by defendants' counsel (PX 50).

22. A nitrogen retention test is and was, at the time of filing the patent application, a measurement of true growth well known by technical workers in experiment stations (R. 222) and by defendants (DX 3; R. 259, 260). Actual feeders refer to weight gain when the supplement embodied in the patent in suit was fed (R. 112). The

specifically- pounds to an average of 3 pounds or better when the supplement embodied in the patent in suit was fed (R. 112). The specification of the patent in suit also refers to the cattle making "good" gains and appearing healthy after being co-fed the patented feed supplement (PX 1, Col 4, last two lines).

23. No statement in the patent in suit provides a basis for a charge of misrepresentation or fraud on the U. S. Patent Office. The fact that the patent applicants did not call to the attention of the U. S. Examiner the citation by the German Patent Examiner in the German application corresponding to the U. S. patent application which matured into the patent in suit, of a 1909 article by E. Pott (PX 5A) is without significance here. The unrefuted testimony is that the Pott reference did not deal with any feed supplement containing both urea (or similar materials) and ethanol, but merely with ethanol, primarily in beverages, e.g., wine and beer. If anything, the Pott article taught away from the invention in suit, for the article clearly and strongly recommended that "By all means is the persistent use of * * * alcohol containing feedstuffs for animals to be foregone under all circumstances" (R. 99-106, 219). Indeed, the non-pertinence of the Pott article is further shown in the record, inasmuch as the German Examiner actually issued a corresponding German Patent (PX 8; R. 252) after it was shown that Pott was not pertinent.

E. Commercial Success and Other Indicia of Non-Obviousness

24. Plaintiff, even though a small newcomer in the feed supplement field at the time it began exploitation of the invention in suit under the trademark "MOREA" has

attained considerable commercial success in such exploitation (PX 6, 6A; R. 27-29). This is shown by the fact that between 1955 and 1973, a total of almost 8,000,000 gallons of ethanol were used commercially in its patented "MOREA" product (PX 6, 6A). This amount of alcohol is equivalent to well over 400,000 tons of "MOREA" liquid feed (R. 28). Domestic cattle fed with plaintiff's "MOREA" involved in this suit are valued at $1\frac{1}{2}$ - 2 billion dollars, which is also substantially the total value, calculated on the basis of royalty income, of foreign cattle so fed by plaintiff's foreign licensees (R. 29).

25. The testimony of Augustin, a cattle feeder for about 35 years, was cogent in showing not only commercial success but the practical advantage of the "MOREA" product embodying the invention in suit. Augustin testified that he had purchased from plaintiff a product referred to in some of the testimony as the first generation liquid feed for some time but since using the present "MOREA" product (sometimes referred to as the "second generation liquid feed"), Augustin stopped buying and using the first generation product and has purchased about \$480,000.00 each year of the current "MOREA" product over the past 12 years (R. 112). Augustin testified that he secured greater weight gains and that purchasers of his cattle fed with the current product are better satisfied with the beef, one reason being that there is marbling through the meat instead of fat on the outside, resulting in a more palatable product (R. 112).

26. Plaintiff secured no less than 47 corresponding foreign patents on the same invention, including patents in countries such as Canada, West Germany, Great Britain and Holland (PX 8; R. 34-36). The only country which denied plaintiff a patent was Brazil, and only because

that country does not issue patents on feedstuffs (R. 34-36).

F. Defendants Infringe All of the Claims of the Patent in Suit

27. It has been found that plaintiff, at very considerable expense, purchased a quantity of defendants' accused composition marketed under the name "BOVINO" and had the product tested on test animals in California. At the same time the "BOVINO" product was tested, the same product from which ethanol had been removed so as not to alter the composition otherwise, was also tested, along with the re-constituted "BOVINO" supplement, i.e., "BOVINO" from which ethanol was removed and then fresh ethanol was added.

28. Plaintiff used great care before the tests were made and during the tests to ensure that they would reflect scientifically correct data.

29. Plaintiff has proved by a preponderance of the evidence that all of the claims in the patent have been infringed.

30. Findings numbered 27-29 are supported by findings numbered 31-39, *infra*, among others:

31. Before undertaking the tests, Anderson endeavored to reach agreement with Dr. Hanson, defendants' Manager of Intellectual Property, on the conditions of a proper test (R. 44-48; PX 48).

32. Prior to the filing of this action, plaintiff purchased a quantity of defendants' BOVINO supplement and ran nitrogen tests thereon. (Pre-Trial Order, Paragraph 12).

33. A quantity of BOVINO was processed by Dr. James Garrison of East Shore Chemical Company, Muskegon, Michigan. The material was distilled at low temperature and pressure until essentially all of the ethyl alcohol was removed. The water removed with the ethyl alcohol was then replaced. The processed material was packaged into 6 gallon drums and shipped to C. B. Kern Research Laboratory. No other alteration of the material was made during the processing (R. 121-124).

34. Nitrogen retention tests were conducted at C. B. Kern Research Laboratory, Thermal, California. Three materials were tested: 1) BOVINO as purchased from defendant Kent Feeds, 2) BOVINO with ethyl alcohol removed at East Shore Chemical Company, referred to as distilled BOVINO, and 3) distilled BOVINO with 6% ethyl alcohol added in California (R. 133-134).

35. A group of twelve heifer calves was selected for test suitability out of a group of eighteen. Four of the twelve cattle were fed with each of the three test materials for a period of five days. Samples of urine and feces were taken and tested for nitrogen content during each five day test period (R. 134; PX 24A through 24 L-2, and PX 25). Each of the cattle was subjected to three trial periods in which each was fed a different supplement. The test plan was in accordance with standard statistical procedures known as a crossover plan (PX 25). During the entire test period, a ration of prairie hay pellets marked with chromic oxide was fed ad libitum to the animals (PX 25). All data collected in the test period were reported to Feed Service Corporation (PX 24-A through 24 L-2) by C. B. Billington who designed and conducted the tests (PX 18, PX 24A through 24 L-2; PX 25; R. 156-157).

36. The nitrogen retention data obtained by Billington were statistically analyzed by Anderson. He concluded that "BOVINO" supplement as such and that reconstituted by first removing ethanol and then adding a fresh quantity of alcohol to replace the amount removed did improve nitrogen retention by 42% as compared with the same "BOVINO" supplement from which ethanol had been removed (PX 25, 27 and 44; R. 165-170).

37. The animal tests of plaintiff and Anderson's statistical analysis were confirmed as correct by plaintiff's expert, Dr. Stanley A. Dunn, an independent director of a laboratory of the Bjorksten Research Laboratories, Madison, Wisconsin (R. 181-184; PX 28). Dr. Dunn also testified that plaintiff's tests correspond to good experimental design practice and were carried out with good execution and the statistical analysis was in accordance with accepted standards (R. 181).

38. The Court also finds that defendant's own experts commended the tests and analyses of plaintiff. Professor Burroughs, defendants' expert at the trial, stated the data were fine but he was "disturbed" by the fact that the animals were not fed isocaloric diets, but were fed free-choice, i.e., the animals were free to eat what they wanted (R. 358-359). The Court finds that both methods of testing are accepted (PX 36, PX 40; R. 405-408). Indeed, the free-choice or ad libitum method used by plaintiff actually was in defendants' favor because it gave lower results as regards nitrogen retention of the "BOVINO" supplement, according to another of defendants' experts, Dr. Horace W. Norton (PX 51). Commendations of plaintiff's tests and analyses were also given by Dr. Austin M. Hanson (Hanson Dep. 58).

39. Defendants tested their BOVINO composition (DX 3). Defendants' tests did not measure the effect of ethanol in combination with urea as no test involving BOVINO feed supplement from which ethanol had been removed was conducted (R. 265, 411; D. Ad. 8). Defendants' tests did not conform even with the requirement of its Manager of Intellectual Property, Dr. Hanson, that an analysis of variance should be run on the data (PX 48; R. 413-414). Another defect of the paired feeding technique employed by defendants is that the test animals were underfed (DX 3; R. 412).

40. Each and every claim of the patent in suit has been infringed by defendants' accused compositions (PX 12, 13, 13A, 14, 14A; R. 194-208).

41. Claims 11 and 16 are taken as illustrative of the patent claims.

42. Claim 11. A feed supplement for ruminants comprising urea and ethanol in an amount effective to increase the nitrogen-retention ability of ruminants, said amount being from about 1 to 12 parts by weight per 10 parts by weight of urea.

43. Comparison of Claim 11 and Defendants' Compositions

a. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 are feed supplements (PX 11).

b. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include urea (PX 15, D. Ad. 3 and 4).

c. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include ethanol (D. Ad. 3 and 4).

d. BOVIN-O includes 7.14 to 8.92 parts of ethanol per 10 parts of urea equivalent (PX 15).

e. BOVIN-O-LAC 320 includes 5.84 to 7.79 parts of ethanol per 10 parts of urea equivalent (PX 15).

f. BOVIN-O-LAC 440 includes 3.18 to 4.59 parts of ethanol per 10 parts of urea equivalent (PX 15).

g. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include ethanol sufficient to increase the nitrogen-retention ability of ruminants (PX 18, 21, 24A through 24L-2, inclusive, 25, 27, 28, 36, 40, 44, 48, 51; R. 198-201).

44. Claim 16. A feed supplement for ruminants comprising urea, phosphoric acid, and ethanol in an amount effective to increase the nitrogen-retention ability of ruminants.

45. Comparison of Claim 16 and Defendants' Composition.

a. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 are feed supplements for ruminants (PX 11).

b. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include urea (D. Ad. 3 and 4; PX 15).

c. Ammonium phosphate is the nutritional equivalent of phosphoric acid (PX 1, Col. 4, lines 21-23).

d. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include ammonium phosphate (PX 15).

e. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include molasses (PX 15 and D. Ad. 4).

f. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 contain ethanol (PX 15).

g. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 contain ethanol sufficient to increase the nitrogen-retention ability of ruminants (PX 15, 21, 24A through 24L-2, inclusive, 25, 27, 28, 36, 40, 44, 48, 51; R. 202-203).

G. Defendants' Infringement is Willful and Wanton

46. Defendants had knowledge of plaintiff's patented feed supplement for many years before they began to market their accused compositions in 1970. Mr. James Kent, President and Chairman of the Board of both defendants, and Dr. Charles J. Lewis, now Executive Vice President of Grain Processing Corporation, one of the defendants, and a director and on the Executive Committee of Kent Feeds, Inc., the other defendant, visited plaintiff's plant in Crete, Nebraska, in 1957 or 1958, and were conducted through plaintiff's plant (Lewis deposition, 15-16; D. Ad. 6).

47. At a meeting between plaintiff's and defendants' representatives held at defendants' offices prior to suit, defendants claimed that the accused compositions did not increase nitrogen retention in cattle but refused to furnish plaintiff with test data and any other information which allegedly supported their position (R. 44-48).

48. Defendants, prior to suit, continued in their refusal to furnish any such information or to exchange their test data with plaintiff after plaintiff went to considerable expense to secure and test defendants' accused composition, demanding that plaintiff unilaterally show plaintiff's test data (R. 45-48).

49. As late as May 1974, defendants admitted there was no prior art reference showing the ethanol-synthetic nitrogen combination (Hanson Dep. 154-155). Defendants also admitted that there was no good prior art (PX 49). Defendants further admitted that they had never tested their own accused composition without ethanol (D. Ad. 8; R. 265). Defendants' Dr. Hanson disagreed with their

own counsel's legal opinion as to the meaning of the term "nitrogen retention ability" and was adamant in any manner possible" (PX 50).

50. Defendants had no search of prior art patents made to find relevant prior art until their counsel initiated such a search in July, 1972, subsequent to the filing of the Complaint (PX 49).

51. Defendants' own promotional literature claims that their accused compositions, containing ethanol and urea (a synthetic source of nitrogen) has beneficial results, among which are faster rate of weight gain, better feed efficiency, improved carcass quality, higher returns and profits, significantly improved marbling and 20% more grading choice (PX 11).

52. Defendants' "patent-pending process" for making its accused composition (PX 11) on an application by one, Rouse, was refused U. S. patent protection (R. 287), although defendants' Manager of Intellectual Property, Dr. Hanson, aided defendants' licensor, by his personal presence at and participation in an interview with the U. S. Patent Examiner following the citation of the patent in suit. Dr. Hanson contended that the fermented molasses was a commercial success and noted the beneficial effect of ethyl alcohol in ruminant feeds (PX 42, pp. 07725, 07730).

53. Defendants never attempted to follow the teachings of the patent in suit or observe cattle fed with the patented feed supplement to determine whether the patent complied with the requirements of the patent statutes (Hanson Dep. 148; R. 286; McDonald Dep. 25-26; D. Ans. to P. Int. 45).

54. Defendants' counsel refused to permit its witness to testify during discovery as to whether said counsel ever specifically advised defendants to sell or market BOVINO (Lewis Dep. 27).

55. Defendants' counsel admitted that they had actual knowledge of plaintiff's patent in suit since shortly after it issued (McDonald Dep. 134).

[1] 56. Defendants' entire course of conduct, knowing that the sole difference between defendants' compositions fermented molasses for ethanol, makes this case an ap- and the patented subject matter was the substitution of propriate one for the exercise of the Court,s power to increase damages. Accordingly, defendants' infringement of the claims of the patent in suit is willful and wanton, and plaintiff is entitled to have its damages increased up to three times the amount assessed, as prescribed by 35 U. S.C. 284. In addition, the facts show that this is an exceptional case within the meaning of 35 U.S.C. 285, and plaintiff is entitled to an award of reasonable attorneys' fees.

H. The Patent in Suit is Valid

57. Defendants gave notice, under 35 U.S.C. 282, of no less than 47 literature articles, 40 U.S. and foreign patents and 32 persons they would rely upon to show invalidity and noninfringement.

58. Defendants' own witnesses, in discovery testimony, documentation and testimony at the trial, frankly admitted that the prior art failed to teach or suggest the conjoint use of synthetic nitrogen-containing substances, such as urea, and ethanol in feed supplements (R. 298; PX 49; Ranson Dep. 154-155).

59. The prior art fails to teach or render obvious the conjoint use of synthetic nitrogen-containing substances, such as urea, and ethanol in feedstuff supplements in amounts effective to increase the nitrogen retention ability of ruminants such as cattle (R. 225; PX 49).

60. The prior art failed to appreciate the unobvious results flowing from the conjoint use of synthetic nitrogen-containing substances such as urea and ethanol in feed supplements for ruminants such as cattle (PX 1).

61. The Court, after determining the scope and content of the prior art, ascertaining the differences between the prior art and the claims at issue, and resolving the level of ordinary skill in the art of making and using feed supplements for ruminants (cattle), finds that the claims in the patent in suit are all valid.

62. None of the prior art references actually offered into evidence discloses or renders obvious the conjoint use of synthetic nitrogen substances, such as urea, and ethanol, in co-fed feed suupplements for the purpose of increasing the nitrogen retention ability, i.e., improve weight gains of ruminants (see e.g. Findings Nos. 63-84).

63. U. S. Patent No. 2,748,001 (PX 2) discloses a molasses-urea-phosphoric acid liquid feed supplement. The differences between the PX 2 products and those made under the patent in suit (PX 1) are of a very substantial nature (R. 21, 22, 112, 417-419).

64. The 1942 thesis by Malzahn (DX 9) deals with the fermentation of alfalfa silage. While varying and insignificant amounts of ethanol are reported to be present in the silage, there is a serious question as to whether any

ethanol in fact is present because the analytical method employed probably attributed the ethanol content to a combined form, i.e., ethyl acetate (PX 41 and PX 52; R. 401, 404).

65. Malzahn's thesis recognizes the nonuniformity of silage, depending on the type of legume from which it is made and the locality.

66. Malzahn's thesis does not disclose or suggest the use of urea, a fact corroborated by Dr. Malzahn at the trial (DX 9; R. 298).

67. The 1921 article by Fred et al. (DX 10) and the 1919 article by Peterson et al. (DX 11) are similar to Malzahn's thesis except that they deal with the relation of lactic acid bacteria to corn silage.

68. The 1912 article by Hart et al. deals with volatile fatty acids and alcohols in corn silage (DX 12) and is similar, insofar as any pertinence it may possess, to the Malzahn, Fred et al. and Peterson et al. references.

69. The results of a feeding experiment using corn silage and various supplements are disclosed in a July 1953 article emanating from Iowa State College (DX 15). There is no disclosure that ethanol formed any part of the feedstuffs dealt with in the article. Defendants' expert, Burroughs *assumed* (R. 353) that the corn silage contained 0.22% of ethanol, and then proceeded to calculate the urea-ethanol ratio and amounts in the feedstuff (DX 38). Defendants' exhibit (DX 2) shows that even corn silage, sealed in plastic bags and stored in a freezer for 4 days, may not contain any ethanol at all. Of 15 analytical determinations for ethanol, 3 samples analyzed ethanol-

free, and 8 samples analyzed out to ethanol contents under 0.22 percent, which was the amount assumed to be present by Prof. Burroughs. The latter admitted that he did not in fact test the silage of DX 15 for ethanol content (R. 381).

70. Dr. Rapp's unrefuted testimony was that the gains in all cases reported in DX 15 did not amount to more than 2 pounds per day which is under the average daily gain (R. 391-392), and that corn silage is not suitable for use as a commercial product. It is too bulky and cannot be transported distances over 10 miles. It is not uniform, not always stable (R. 395-396). Further, Dr. Rapp testified that the conditions of the DX 2 test were such that ethyl acetate would show up as ethanol content (R. 404).

71. The 1953 article disclosing work done at Purdue University on fattening cattle on corn silage and grass silage does not disclose the presence of ethanol and it has not been shown that any ethanol was in fact present (DX 16).

72. The 1949 Culbertson et al. article disclosed feeding cattle corn silage with and without additional corn grain, urea and ground corn cobs (DX 20). The article does not disclose the presence of ethanol nor was such presence shown at the trial.

73. The 1949 article by Baker et al (DX 21) is similar in its teachings to the Culbertson et al. article (DX 20).

74. Defendants' prior art references, DX 27, 28, 29, 30, 31, 32 and 34 were produced by plaintiff during discovery, and they do not singly or in combination disclose any feed supplement containing ethanol and a substance such as urea.

75. The DX 27 patent, issued in 1901, employs very small amounts of ethanol (less than 0.4%) primarily as a solvent for salt and not for its food value. The composition disclosed by this reference comprises ethanol, salt, blood, a fibrous substance and sugar, and bears no actual and practical resemblance to the feed supplements covered by the claims of the patent in suit.

76. The DX 28 patent issued in 1911 discloses an animal feed consisting of fermented ground grain, water, and yeast to which is added more ground grain and molasses, permitting the whole to ferment for a short time, and then drying the resulting mixture. The resulting mixture is not shown to have any ethanol and is devoid of urea, too.

77. The DX 29 patent, issued in 1912, discloses the use of distillery slop in animal feed. The patent in suit referred to the known use of distillery slop in animal feeds, and this reference fails to teach the conjoint use of ethanol and urea.

78. The DX 30 patent, issued in 1915, is similar to the DX 29 patent already discussed.

79. The DX 31 patent, issued in 1923, discloses a method of reducing coarse farm products to stock feed. The method consists in subjecting the products, in a solution of diastase, through gradually reducing temperatures from a point below the boiling point of water to a point suitable for stock consumption. No disclosure or suggestion of liquid or other feed supplements having urea and ethanol is present in this reference.

80. The DX 32 patent, issued in 1927, discloses a method of transforming farm roughage involving mixing with the

roughage a fermentation agent containing diastase and subjecting the roughage to non-acidifying fermentative activity. No disclosure or suggestion of liquid or other feed supplements having urea and ethanol is present in this reference.

81. The DX 34 patent, issued in 1941, merely involves the treatment of distillery slop with bentonite. No disclosure or suggestion of liquid or other feed supplements having urea and ethanol is present in this reference.

82. Defendants' Manager of Intellectual Property, who was fully conversant with the prior art (PX 49, 50) admitted that as late as January 31, 1974, he had no knowledge as to whether urea-treated silage contains ethanol (Hanson Dep. 82).

83. Dr. Hanson further testified at his discovery deposition, after having defendants' Notice in Accordance with 35 U.S.C. 382 handed to him, that he was not aware of any disclosure in any publication or patent dated prior to the filing date of the patent in suit which teaches the incorporation in a feed ration of ethanol and urea (Hanson Dep. 154-155).

84. Dr. McDonald, defendants' ruminant nutritionist, and Rule 30(b) (c), F.R.C.P. witness on discovery, conceded that ethanol is beneficial from the standpoint of improving carcass quality or marbling and increasing the total feed intake of cattle when allowed to consume all they want (McDonald Dep. 77-78).

85. The level of ordinary skill in the art of feed supplement preparation and use is clearly shown by the record to have failed to appreciate the unexpected benefits accru-

ing from the conjoint use of substances such as urea and ethanol, as disclosed and claimed in the patent in suit. This is so even though scores of prior art references and persons having knowledge of the invention in suit were noticed by defendants and even though most of the prior art actually relied upon by defendants had been in existence from 15 to 55 years prior to the 1955 filing date of the patent in suit.

86. The patented feed supplement brought about unexpected results and has surpassed prior liquid feeds (R. 21-22). Despite the fact that each of the ingredients ethanol and urea were used separately in prior feed supplements or disclosed in prior publications, to combine them together as Anderson-Rapp did required a person reasonably skilled in the art (1) to ignore the advice of the prior art (Pott) not to use ethanol in feedstuffs under all circumstances (PX 5A), (2) to ignore the fact that the only commercial liquid feed on the market in 1955 (PX 2) had only questionable commercial value (R. 21-22), and (3) to predict the unpredictable, i.e. that the conjoint use of ethanol and urea in specified ratios would bring about unexpected, synergistic, desirable results (PX 1; R. 23, 98, 417; Findings Nos. 15 and 16, supra).

87. Every finding of fact deemed a conclusion of law is hereby adopted as a conclusion of law.

II. Conclusions of Law

1. This Court has jurisdiction over the parties and over the subject matter of this suit. Venue is properly laid in this District (PTO, Par. 1).

2. Plaintiff has title to United States Letters Patent

No. 2,808,332 and is the owner of all rights thereunder, including the rights to sue for and to recover for past infringement (PTO, Par. 6).

3. Plaintiff has maintained its burden of proving the essential facts alleged in its Complaint. Defendants have not maintained the burden of proving the essential facts of its Counterclaim. The law is with the plaintiff and against the defendants on each of the issues raised by the pleadings (Minute Order dated December 10, 1974).

4. All of the claims of United States Letters Patent No. 2,808,332 are valid and subsisting in law (Minute Order, December 10, 1974).

5. All of the claims of United States Letters Patent No. 2,808,332 have been infringed by defendants by reason of their manufacture and sale of their accused feed supplement compositions.

6. Defendants did knowingly, willfully and wantonly infringe all of the claims of United States Letters Patent No. 2,808,332. Plaintiff is entitled to an award of treble damages, costs, expenses, and attorneys' fees therefor.

7. Plaintiff is entitled to an accounting by this Court to determine the amount and extent of the damages, and this cause should be continued as to the accounting issues, pursuant to Rule 42 of the Federal Rules of Civil Procedure (PTO, Par. 28).

8. Plaintiff is entitled to a hearing to determine the amount and extent of costs, expenses and attorneys' fees.

9. Every conclusion of law which may be deemed to be a finding of fact shall be so considered.

APPENDIX C

UNITED STATES COURT OF APPEALS
For the Seventh Circuit
Chicago, Illinois 60604

March 19, 1976.

Before

Hon. JOHN PAUL STEVENS, Circuit Justice*

Hon. THOMAS E. FAIRCHILD, Chief Judge

Hon. JOHN S. HASTINGS, Sr. Circuit Judge

FEED SERVICE CORP.,
Plaintiff-Appellee,
No. 75-1188, 1189

vs.

KENT FEEDS, INC., and GRAIN PROCESSING
CORPORATION,
Defendants-Appellants.

Appeals from the United States District Court for the
Northern District of Illinois, Eastern Division.
(73 C 1102)

On consideration of the petition for rehearing and suggestion that it be reheard *en banc* filed in the above-entitled cause, no judge in active service having requested a vote thereon, nor any judge having voted to grant the suggestion, and all of the members of the panel having voted to deny a rehearing,

IT IS ORDERED that the petition for a rehearing in the above-entitled cause be, and the same is hereby,
DENIED.

*Mr. Justice Stevens participated initially as Circuit Judge, and on and after December 19, 1975 as Circuit Justice.

APPENDIX D

FINDINGS OF FACT

10. The Anderson-Rapp invention involved in this suit came into being when the inventors conceived of the combination of ethyl alcohol and a synthetic nitrogen source in February 1955. They formulated feed supplements containing ethyl alcohol and urea, as the source of synthetic nitrogen (PX 1).

16. The patented feed supplement is bottomed on the conjoint use of synthetic-nitrogen substances, e.g., urea, and ethanol, in a ratio such that cattle co-fed with it will have the property or ability to retain more nitrogen, i.e., the cattle will have increased true weight gains. The preferred ratio is from about 1 to 12 parts by weight of ethanol to 10 parts by weight of urea, or the equivalent of the latter (see, e.g., PX 1, Col. 3, lines 68-71). The combination of the specific amounts of urea and ethanol bring about synergistic results, i.e., the results are better than would be expected from the contributions of each of the ingredients, used separately (R. 98, 417).

41. Claims 11 and 16 are taken as illustrative of the patent claims.

42. Claim 11.

A feed supplement for ruminants comprising urea and ethanol in an amount effective to increase the nitrogen-retention ability of ruminants, said amount being from about 1 to 12 parts by weight per 10 parts by weight of urea.

43. Comparison of Claim 11 and Defendants' Compositions

- a. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 are feed supplements (PX 11).
- b. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include urea (PX 15, D. Ad. 3 and 4).
- c. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include ethanol (D. Ad. 3 and 4).
- d. BOVIN-O includes 7.14 to 8.92 parts of ethanol per 10 parts of urea equivalent (PX 15).
- e. BOVIN-O-LAC 320 includes 5.84 to 7.79 parts of ethanol per 10 parts of urea equivalent (PX 15).
- f. BOVIN-O-LAC 440 includes 3.18 to 4.59 parts of ethanol per 10 parts of urea equivalent (PX 15).
- g. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include ethanol sufficient to increase the nitrogen-retention ability of ruminants (PX 18, 21, 24A through 24L-2, inclusive, 25, 27, 28, 36, 40, 44, 48, 51; R. 198-201).

44. Claim 16.

A feed supplement for ruminants comprising urea, phosphoric acid, and ethanol in an amount effective to increase the nitrogen-retention ability of ruminants.

45. Comparison Of Claim 16 And Defendants' Compositions.

- a. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 are feed supplements for ruminants (PX 11).
- b. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include urea (D. Ad. 3 and 4; PX 15).
- c. Ammonium phosphate is the nutritional equivalent of phosphoric acid (PX 1, Col. 4, lines 21-23).
- d. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include ammonium phosphate (PX 15).

- e. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 include molasses (PX 15 and D. Ad. 4).
- f. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 contain ethanol (PX 15).
- g. BOVIN-O, BOVIN-O-LAC 320 and BOVIN-O-LAC 440 contain ethanol sufficient to increase the nitrogen-retention ability of ruminants (PX 15, 21, 24A through 24L-2, inclusive, 25, 27, 28, 36, 40, 44, 48, 51; R. 202-203).

62. None of the prior art references actually offered into evidence discloses or renders obvious the conjoint use of synthetic nitrogen substances, such as urea, and ethanol, in cofed feed supplements for the purpose of increasing the nitrogen retention ability, i.e., improve weight gains of ruminants (see e.g. Findings Nos. 63-84).

86. The patented feed supplement brought about unexpected results and has surpassed prior liquid feeds (R. 21-22). Despite the fact that each of the ingredients ethanol and urea were used separately in prior feed supplements or disclosed in prior publications, to combine them together as Anderson-Rapp did required a person reasonably skilled in the art (1) to ignore the advice of the prior art (Pott) not to use ethanol in feedstuffs under all circumstances (PX 5A), (2) to ignore the fact that the only commercial liquid feed on the market in 1955 (PX 2) had only questionable commercial value (R. 21-22), and (3) to predict the unpredictable, i.e. that the conjoint use of ethanol and urea in specified ratios would bring about unexpected, synergistic, desirable results (PX 1: R. 23, 98, 417; Findings Nos. 15 and 16, supra).

CONCLUSIONS OF LAW

- 4. All of the claims of United States Letters Patent

No. 2,808,332 are valid and subsisting in law (Minute Order, December 10, 1974).

5. All of the claims of United States Letters Patent No. 2,808,332 have been infringed by defendants by reason of their manufacture and sale of their accused feed supplement compositions.

6. Defendants did knowingly, willfully and wantonly infringe all of the claims of United States Letters Patent No. 2,808,332. Plaintiff is entitled to an award of treble damages, costs, expenses, and attorneys' fees therefor.

/s/ W. J. Lynch
Judge, United States District Court

Dated: Feb. 26, 1975

APPENDIX E

... one may file a cosponding patent publication abroad, one must obtain a license from the U.S. Commissioner of Patents, and this is a copy of the license.

THE COURT: Thank you. I did not know or understand that.

BY MR. CIFELLI:

Q. Did you in fact file any corresponding foreign patent applications pursuant to Plaintiff's Exhibit 7?

MR. CAVANAUGH: Objection to the question, your Honor. That is irrelevant. The foreign filing is not at issue in this case.

THE COURT: But it might show — I will let him answer subject to your motion to strike it at a later moment in the event it is not connected with the issues in this case. I take it that it will be.

I believe there was only one that was turned down, wasn't there, and that was Russia?

MR. CIFELLI: Brazil.

THE COURT: Brazil. Well, I wasn't even close. But I mean I knew there was one country that had refused it because they didn't have any provision for the issuance, is that correct?

MR. CIFELLI: That is correct.

REQUEST NO. 18

If the answer to Interrogatory No. 17 is in the affirmative, state whether any such foreign application has been

rejected or been abandoned or any patent issuing thereon has lapsed. If so:

- (a) identify each such foreign application which has become abandoned or rejected and each patent which has become abandoned;
- (b) give the date of abandonment, rejection or lapsing with respect to each such foreign application and patent;
- (c) identify all persons who had or have knowledge of such abandonment, rejection or lapsing as to each such application and patent; and
- (d) produce all documents which refer or relate to any such abandonment, rejection or lapsing.

RESPONSE

(a) The only patent application listed in the response to Request 17 which was abandoned is the Brazilian patent application. The Brazilian Examiner held that Article 8 of the Brazilian code prohibited the grant of patents on food compositions for animals. The Brazilian application was abandoned on or about Jan. 22, 1957.